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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,519	02/06/2004	Cong Lu	021653-002200US	6543
20350	7590	10/31/2005	EXAMINER	
TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			LUU, CHUONG A	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 10/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

**Office Action Summary**

Application No.

10/773,519

Applicant(s)

LU, CONG

Examiner

Chuong A. Luu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election of Group I, claims 1-18 in the reply filed on August 18, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

**DETAILED ACTION**

**PRIOR ART REJECTIONS**

**Statutory Basis**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**The Rejections**

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiota et al. (U.S. 20040086788) in view of Isao et al. (U.S. 5,474,864).

Shiota disclose a phase-shift mask with

**(1); (11)** providing a quartz substrate **(2)** having a surface, the quartz substrate comprising a thickness (see paragraph [0013]);

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forming a MoSi film overlying the surface of the quartz substrate (see paragraph [0012]);

patterning the MoSi film overlying the quartz substrate to form a mask pattern (see paragraphs [0012]-[0014]); forming an opaque edge structure; whereupon the opaque edge structure has a light transmittance ranging from about 0% to about 3% (see paragraphs [0016]-[0023]);

**(3); (15)** wherein the forming of the opaque edge structure is provided by focused ion beam (see paragraph [00185]);

**(4); (16)** wherein the opaque edge structure occupies a region on the quartz substrate that is free from the mask pattern (see paragraphs [0016]-[0023]);

**(5); (17)** wherein the mask pattern is for a half tone phase shift mask (see paragraphs [0016]-[0023]);

**(6); (18)** further comprising cleaning the patterned MoSi film and opaque edge structure (see paragraphs [0016]-[0023]);

**(8)** wherein the patterning of the MoSi film is a photolithography process (see paragraphs [0016]-[0023]);

**(9)** wherein the patterning is the only photolithography process used by the method (see paragraphs [0016]-[0023]);

**(10)** wherein the mask pattern is free from a chrome film (see paragraphs [0016]-[0023]);

**(12)** wherein the mask structure is a mask (see paragraphs [0016]-[0023]).

Shiota teaches the above outlined features except for edge structure comprising a carbon bearing material on a portion of the surface around a peripheral region of the mask pattern. However, Isao discloses a phase shift mask with (1); (11)... edge structure comprising a carbon bearing material on a portion of the surface around a peripheral region of the mask pattern (see column 17, lines 1-28. Figure 26); (2); (14) wherein the forming of the opaque edge structure is provided by laser deposition (see column 17, lines 1-28. Figure 26); (7); (13) wherein the carbon is in a C12, C13, C14 state. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Shiota's device (accordance with the teaching of Isao) to form a phase-shift mask since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art and it is noted that the applicant does not disclose criticality in the ranges claimed. In re Leshin, 125 USPQ 416 and In re Aller, 105 USPQ 233 (see MPEP 2144.05). Doing so would facilitate the manufacture of the semiconductor device and improve the protection characteristics of the cap layer on the semiconductor structure.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:15-2:45).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chuong Anh Luu  
Patent Examiner  
October 24, 2005